2006 ACCESSORIES & EQUIPMENT

Keyless Entry - Lucerne

SCHEMATIC AND ROUTING DIAGRAMS

KEYLESS ENTRY SCHEMATICS

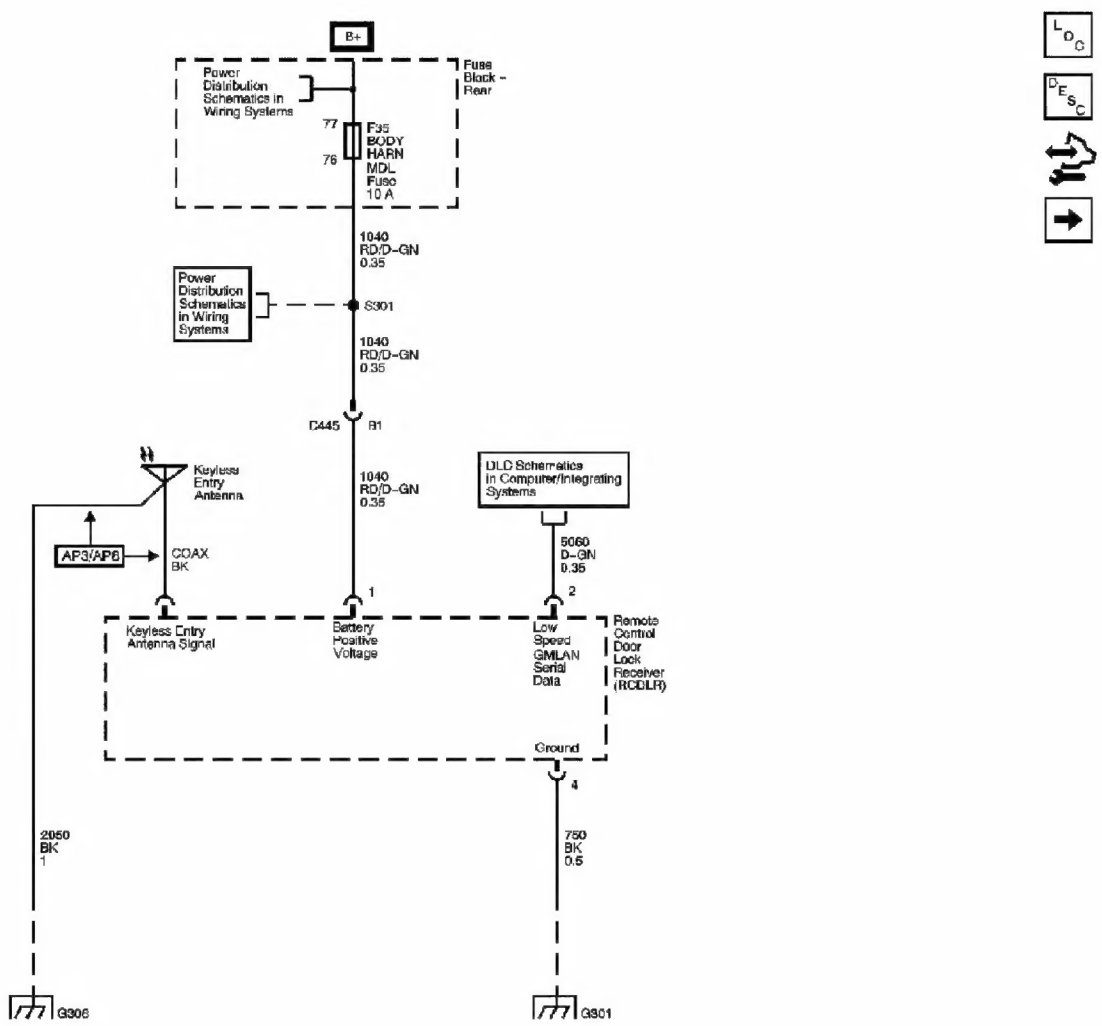


Fig. 1: Remote Control Door Lock Receiver Schematics - RCDLR
Courtesy of GENERAL MOTORS CORP.

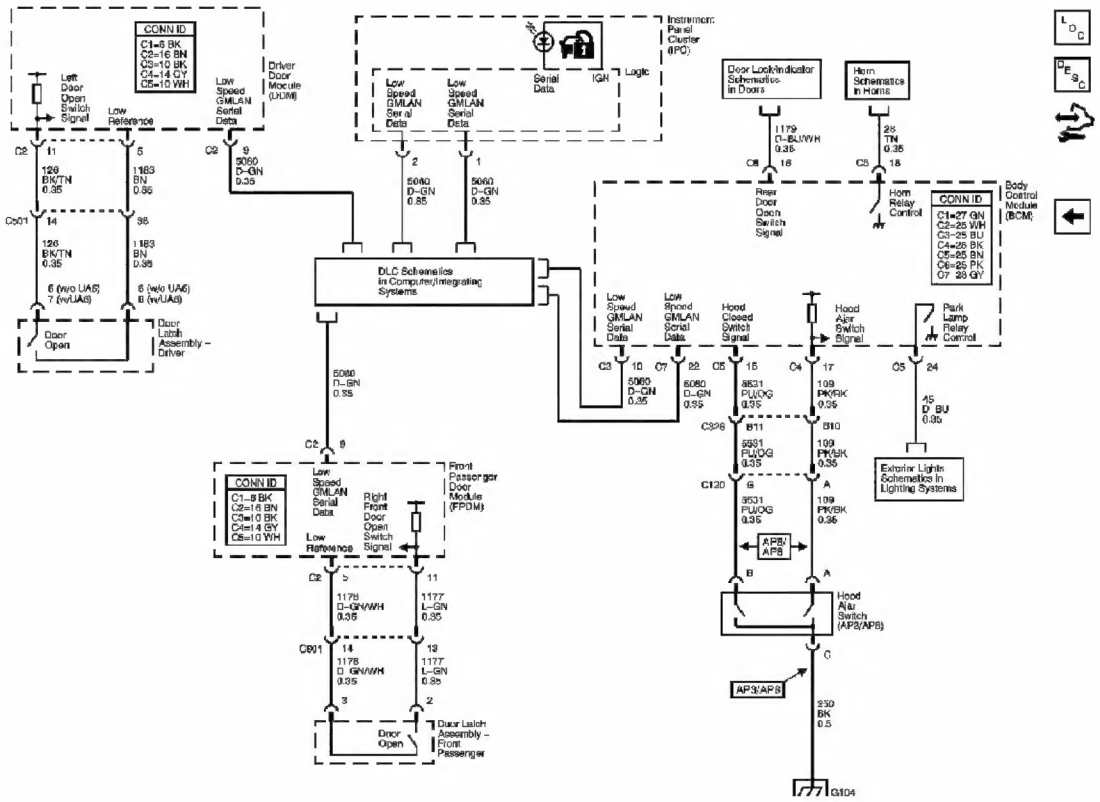


Fig. 2: Door Latch Assemblies & Hood Ajar Switch Schematics
Courtesy of GENERAL MOTORS CORP.

COMPONENT LOCATOR

KEYLESS ENTRY COMPONENT VIEWS

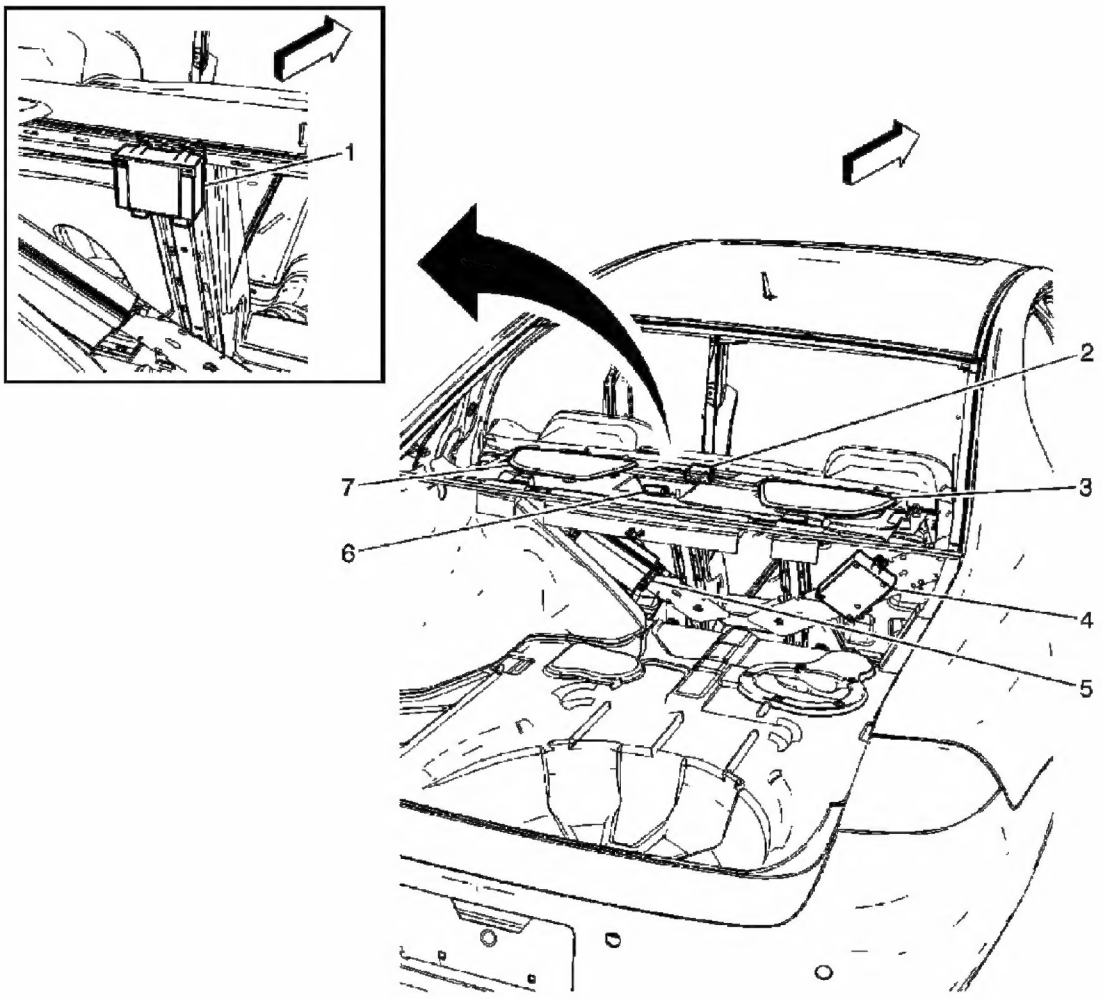


Fig. 3: View From Behind Rear Seat
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 3

Callout	Component Name
1	Remote Control Door Lock Receiver (RCDLR)
2	Rear Park Assist Indicator (UD7)
3	Speaker - RR
4	Vehicle Communication Interface Module (VCIM) (UE1)
5	Amplifier (UQA)
6	Rear Compartment Courtesy Lamp
7	Speaker - LR

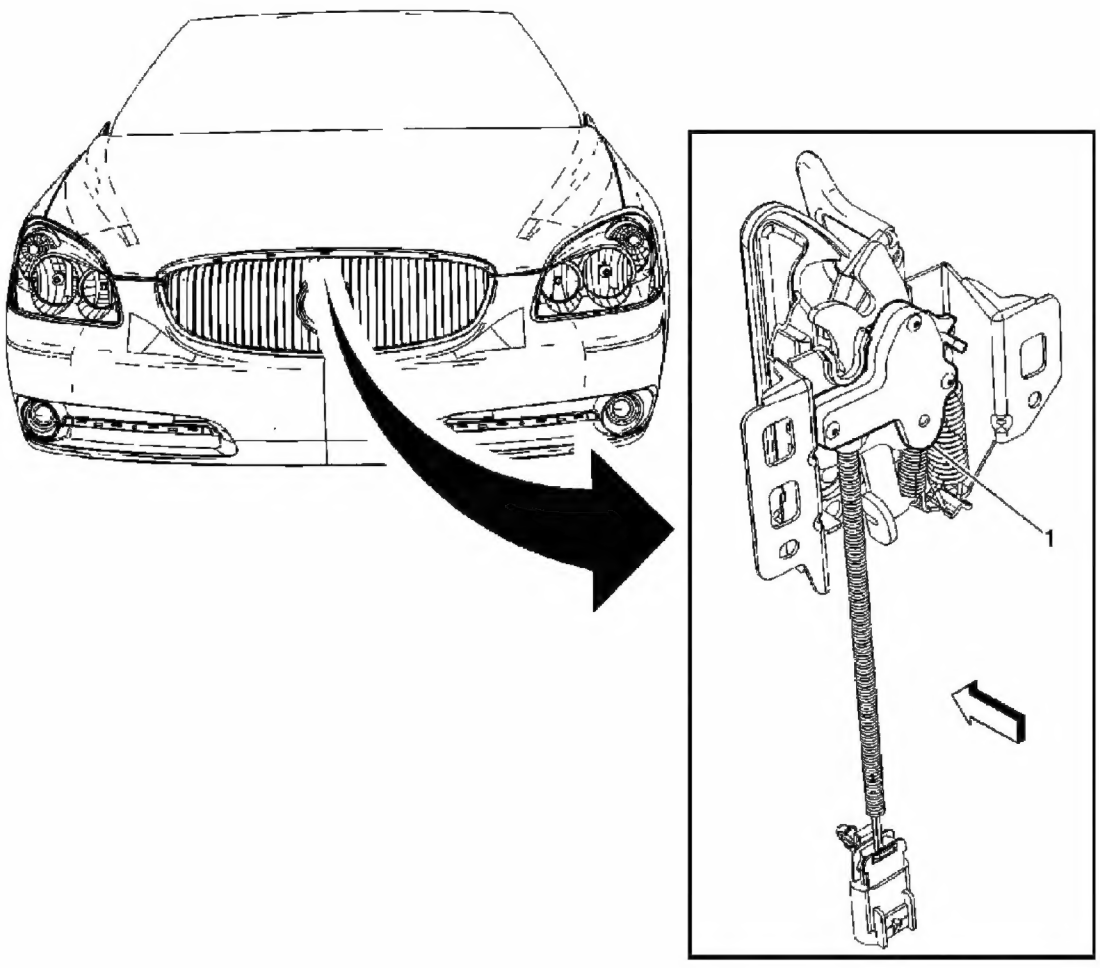


Fig. 4: View Of Front Of Engine Compartment
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 4

Callout	Component Name
1	Hood Ajar Switch (AP3/AP8)

KEYLESS ENTRY CONNECTOR END VIEWS

Hood Ajar Switch (AP3/AP8)

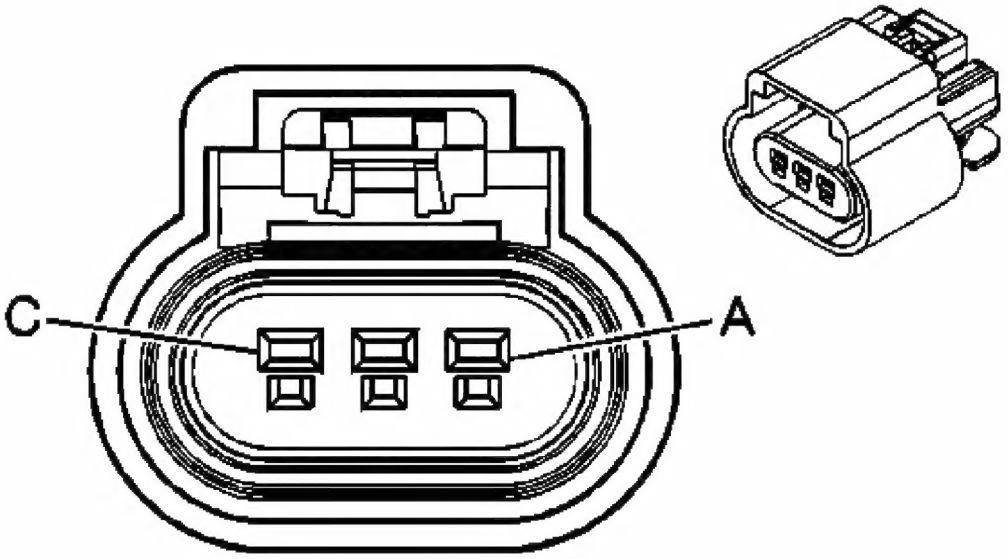


Fig. 5: Hood Ajar Switch (AP3/AP8) Connector End View
Courtesy of GENERAL MOTORS CORP.

Keyless Entry Connector End Views

Connector Part Information

- OEM: 15326808
- Service: See Catalog
- Description: 3-Way F GT 150 Series Sealed 4.5 (BK)

Terminal Part Information

- Terminal/Tray: 12191819/8
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 15315247/J-35616-2A (GY)

Hood Ajar Switch (AP3/AP8)

Pin	Wire Color	Circuit No.	Function
A	PK/BK	109	Hood Ajar Switch Signal
B	PU/OG	5531	Hood Closed Switch Signal
C	BK	250	Ground

Remote Control Door Lock Receiver (RCDLR)

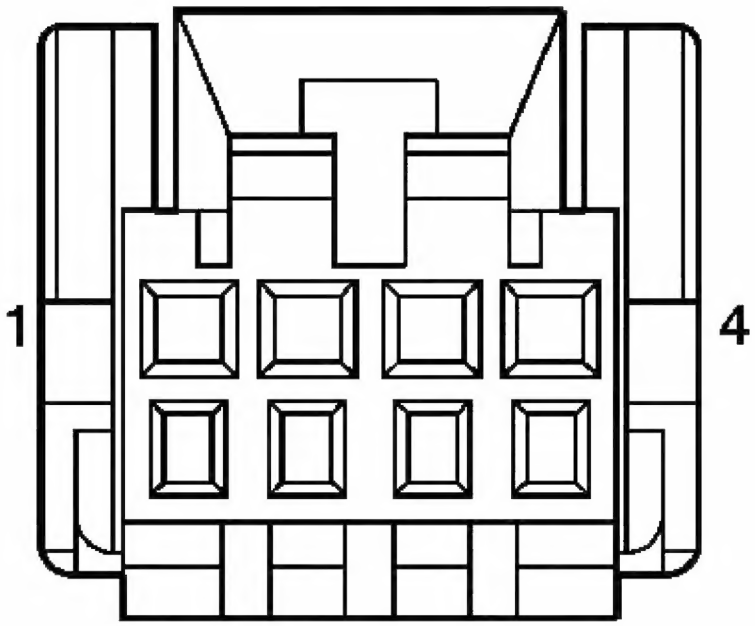


Fig. 6: Remote Control Door Lock Receiver (RCDLR) Connector End View
Courtesy of GENERAL MOTORS CORP.

Keyless Entry Connector End Views

Connector Part Information

- OEM: ILAG54SS3C1
- Service: See Catalog
- Description: 4-Way F (BK)

Terminal Part Information

- Pins: 1, 2, 4
- Terminal/Tray: See Terminal Repair Kit
- Core/Insulation Crimp: See Terminal Repair Kit
- Release Tool/Test Probe: See Terminal Repair Kit

Remote Control Door Lock Receiver (RCDLR)

Pin	Wire Color	Circuit No.	Function
1	RD/D-GN	1040	Battery Positive Voltage
2	D-GN	5060	Low Speed GMLAN Serial Data

Pin	Wire Color	Circuit No.	Not Used	Function
4	RD/BK-GN	750	Battery Positive Voltage	

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
DTC B3105	Keyless Entry System Key Fobs Not Programmed
DTC B3109, B3110, B3111 or B3112	** MULTIPLE VALUES **

DIAGNOSTIC STARTING POINT - KEYLESS ENTRY

Begin the system diagnosis with **Diagnostic System Check - Vehicle** in Vehicle DTC Information. The Diagnostic System Check will provide the following information:

- The identification of the control module(s) which command the system
- The ability of the control module(s) to communicate through the serial data circuit
- The identification of any stored diagnostic trouble codes (DTCs) and their status

The use of the Diagnostic System Check will identify the correct procedure for diagnosing the system and where the procedure is located.

SCAN TOOL OUTPUT CONTROLS

Scan Tool Output Controls

Scan Tool Output Control	Additional Menu Selection(s)	Description
Key Fob Button Test	Output Controls	The RCDLR monitors the incoming RF communications to ensure all keyless entry transmitter functions are operating properly.

SCAN TOOL DATA LIST

RCDLR

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition ON, Engine OFF.			
Last Fob Used	Key FOB Information	None/Fob 1/Fob 2/Fob 3/Fob 4/Fob 5	Varies

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition ON, Engine OFF			
Fob 1 Programmed	Key FOB Information	Yes/No	Varies
Last Fob Used	Key FOB Information	None/Fob 1/Fob 2/Fob 3/Fob 4/Fob 5	Varies
Fob 1 Function	Key FOB Information	None/Lock/Dr Door Unlock/All Door Unlock/R Closure Rel./Panic/Engine Start/Engine Stop/Fob Program/Locate	Varies
Fob 1 Battery	Key FOB Information	OK/Low	OK
Fob 2 Programmed	Key FOB Information	Yes/No	Varies
Fob 2 Function	Key FOB Information	None/Lock/Dr Door Unlock/All Door Unlock/R Closure Rel./Panic/Engine Start/Engine Stop/Fob Program/Locate	Varies
Fob 2 Battery	Key FOB Information	OK/Low	OK
Fob 3 Programmed	Key FOB Information	Yes/No	Varies
Fob 3 Function	Key FOB Information	None/Lock/Dr Door Unlock/All Door Unlock/R Closure Rel./Panic/Engine Start/Engine Stop/Fob Program/Locate	Varies
Fob 3 Battery	Key FOB Information	OK/Low	OK
Fob 4 Programmed	Key FOB Information	Yes/No	Varies
Fob 4 Function	Key FOB Information	None/Lock/Dr Door Unlock/All Door Unlock/R Closure Rel./Panic/Engine Start/Engine Stop/Fob	Varies

		Ignition Driver Door	
Fob 1 Battery	Key FOB Information	OK Low	OK

SCAN TOOL DATA DEFINITIONS

Battery Voltage Signal

The scan tool displays the current system battery voltage.

Last Fob Used

The scan tool indicates the last keyless entry transmitter used to active the keyless entry system.

Fob 1 Programmed

The scan tool displays whether a keyless entry transmitter is currently programmed into the #1 slot.

Fob 1 Function

The scan tool indicates the lasted keyless entry function commanded by the keyless entry transmitter programmed to the #1 slot.

Fob 1 Battery

The scan tool displays the current battery state of the keyless entry transmitter battery as either Low or OK.

Fob 2 Programmed

The scan tool displays whether a keyless entry transmitter is currently programmed into the #2 slot.

Fob 2 Function

The scan tool indicates the lasted keyless entry function commanded by the keyless entry transmitter programmed to the #2 slot.

Fob 2 Battery

The scan tool displays the current battery state of the keyless entry transmitter battery as either Low or OK.

Fob 3 Programmed

The scan tool displays whether a keyless entry transmitter is currently programmed into the #3 slot.

Fob 3 Function

The scan tool indicates the lasted keyless entry function commanded by the keyless entry transmitter programmed to the #3 slot.

Fob 3 Battery

The scan tool displays the current battery state of the keyless entry transmitter battery as either Low or OK.

Fob 4 Programmed

The scan tool displays whether a keyless entry transmitter is currently programmed into the #4 slot.

Fob 4 Function

The scan tool indicates the lasted keyless entry function commanded by the keyless entry transmitter programmed to the #4 slot.

Fob 4 Battery

The scan tool displays the current battery state of the keyless entry transmitter battery as either Low or OK.

DTC B3105

DTC Descriptor

DTC B3105

Keyless Entry System Key Fobs Not Programmed

Diagnostic Fault Information

Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.

Circuit/System Description

The remote control door lock receiver (RCDLR) monitors the number of keyless entry transmitters programmed.

Conditions for Running the DTC

The keyless entry system is enabled.

Conditions for Setting the DTC

The DTC is set if there are no learned key fobs in the RCDLR.

Action Taken When the DTC Sets

The keyless entry system is inoperative.

Conditions for Clearing the DTC

The DTC is cleared when at least one fob is programmed to the RCDLR.

Reference Information

Schematic Reference

Keyless Entry Schematics

Connector End View Reference

Keyless Entry Connector End Views

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Scan Tool Data List

Scan Tool Data Definitions

Special Tools Required

J 43241 Keyless Entry Tester. See **Special Tools**.

Circuit/System Testing

1. Verify that the transmitter being used is a correct transmitter for the vehicle.
   - If not the correct transmitter, replace the transmitter.

2. Place the transmitter on the test pad of the **J 43241** and press each button of the transmitter one at a time. See **Special Tools**. The tester should sound a tone and illuminate a green light when each button is pressed.
    - If any of the buttons do not sound the tone and illuminate the green light, replace the transmitter battery. Retest with the **J 43241** . See **Special Tools**. If the transmitter continues to malfunction, replace the affected transmitter.
3. Verify the scan tool Fob Programmed parameter for the transmitter being used is Yes.
    - If not the specified value, program the applicable transmitter.
4. Press each transmitter button. Verify the scan tool Fob Function parameter for the transmitter being used responds to each button press.
    - If the parameter does not respond, test the keyless entry antenna for an open/high resistance. If all circuits test normal, replace the RCDLR.
5. If all circuits test normal, test or replace the RCDLR.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Transmitter Battery Replacement**
- **Transmitter Programming**
- **Control Module References** for RCDLR replacement, setup and programming

DTC B3109, B3110, B3111 OR B3112

DTC Descriptor

DTC B3109

Keyless Entry Transmitter 1 Low Battery

DTC B3110

Keyless Entry Transmitter 2 Low Battery

DTC B3111

Keyless Entry Transmitter 3 Low Battery

DTC B3112

Keyless Entry Transmitter 4 Low Battery

Diagnostic Fault Information

Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.

Circuit/System Description

With each press of a keyless entry transmitter button, a message containing the current battery state of the transmitter is sent to the remote control door lock receiver (RCDLR) along with the commanded keyless entry function.

Conditions for Running the DTC

The keyless entry system must be enabled.

Conditions for Setting the DTC

The DTC sets after 3 consecutive low battery signals from the same programmed transmitter.

Action Taken When the DTC Sets

The keyless entry system is inoperative.

Conditions for Clearing the DTC

The DTC is cleared when a normal transmitter voltage signal is received from any programmed transmitter.

Reference Information

Schematic Reference

Keyless Entry Schematics

Connector End View Reference

Keyless Entry Connector End Views

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Scan Tool Data List

Scan Tool Data Definitions

Circuit/System Verification

Verify none of the following DTCs are set:

- DTC B 3109
- DTC B 3110
- DTC B 3111
- DTC B 3112

- If any of the DTCs are set, replace the battery in the applicable keyless entry transmitter. Operate the applicable transmitter 3 consecutive times. If any of the DTCs reset, replace the applicable keyless entry transmitter.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Transmitter Battery Replacement

Transmitter Programming

SYMPTOMS - KEYLESS ENTRY

IMPORTANT: The following steps must be completed before using the symptom tables.

1. Perform **Diagnostic System Check - Vehicle** in Vehicle DTC Information before using the Symptom Tables in order to verify that all of the following are true:
   - There are no DTCs set.
   - The control modules can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to **Keyless Entry System Description and Operation**.

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the Keyless Entry System. Refer to **Checking Aftermarket Accessories** in Wiring Systems.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems.

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- **Keyless Entry System Inoperative**
- **Remote Vehicle Start Inoperative**

KEYLESS ENTRY SYSTEM INOPERATIVE

Diagnostic Fault Information

Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.

Circuit/System Description

When a keyless entry transmitter button is pressed, an RF signal is sent to the vehicle. The remote control door lock receiver (RCDLR) receives this RF signal by way of the keyless entry/tire pressure antenna. When the RF signal is received, the RCDLR determines the specific command sent by the transmitter and will relay this message to the body control module (BCM) via serial data. The BCM will then perform the command.

Reference Information

Schematic Reference

Keyless Entry Schematics

Connector End View Reference

Keyless Entry Connector End Views

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Scan Tool Data List

Scan Tool Data Definitions

Special Tools Required

J 43241 Keyless Entry Tester. See **Special Tools**.

Circuit/System Testing

1. Verify that the transmitter being used is a correct transmitter for the vehicle.
   - If not the correct transmitter, replace the transmitter.
2. Place the transmitter on the test pad of the J 43241 and press each button of the transmitter one at a time. The tester should sound a tone and illuminate a green light when each button is pressed.
   - If any of the buttons do not sound the tone and illuminate the green light, replace the transmitter battery. Retest with the J 43241. If the transmitter continues to malfunction, replace the affected transmitter.
3. Verify the scan tool Fob Programmed parameter for the transmitter being used is Yes.
   - If not the specified value, program the applicable transmitter.
4. Press each transmitter button. Verify the scan tool Fob Function parameter for the transmitter being used responds to each button press.
   - If the parameter does not respond, test the keyless entry antenna for an open/high resistance. If all circuits test normal, replace the RCDLR.
5. If all circuits test normal, test or replace the RCDLR.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Transmitter Battery Replacement

Transmitter Programming

Control Module References for RCDLR replacement, setup and programming.

REMOTE VEHICLE START INOPERATIVE

Diagnostic Fault Information

Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.

Circuit/System Description

Remote vehicle start (RVS) begins as an RF message received by the remote control door lock receiver (RCDLR) from a keyless entry transmitter. The RVS request is sent by the RCDLR to the body control module (BCM) via serial data. The BCM monitors system conditions such as content theft deterrent (CTD), hood ajar status and body DTCs to determine if an RVS even will occur. If conditions are determined to be acceptable, the RVS message is sent to the engine control module (ECM). The ECM monitors system conditions such as engine control

parameters and vehicle theft deterrent (VTD) to determine if engine starting will be allowed. If conditions are acceptable, the ECM will initiate engine starting. During the engine run time in a RVS attempt, before the operator enters the vehicle, the ECM may discontinue engine operation if system conditions require it or a message is received from the BCM requesting the engine be turned OFF.

Diagnostic Aids

A theft deterrent module (TDM) which has been incorrectly set up may cause a theft deterrent condition which will inhibit RVS operation. If the TDM has recently been replaced or a theft deterrent malfunction is suspected, verify the TDM has been properly set up using SPS prior to continuing with the Remote Vehicle Start Inoperative diagnostic below.

The RVS system will not operate if any of the following conditions are present:

- The key is in the ignition.
- The vehicle is in valet mode.
- More than 2 remote starts have been attempted.
- The hazard switch is in the ON position.
- A current hazard switch DTC is set.
- The vehicle hood is ajar.
- A current hood ajar DTC is set.
- The CTD system detects an alarm trigger.
- Excessive engine RPM
- Excessive coolant temperature
- Accelerator pedal position greater than 0 percent
- Vehicle not in park
- Vehicle theft deterrent malfunction
- A current automatic transmission shift lock control system DRC is set.
- A vehicle speed sensor signal is detected by the ECM.
- A current vehicle DTC that illuminates the malfunction indicator lamp (MIL)

Reference Information

Schematic Reference

Keyless Entry Schematics

Connector End View Reference

Keyless Entry Connector End Views

Description and Operation

Keyless Entry System Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Scan Tool Data List

Scan Tool Data Definitions

Circuit/System Verification

1. Verify that RVS is enabled in the vehicle driver information center (DIC).
   - If RVS is not enabled, refer to **Vehicle Personalization** .
2. Verify that the keyless entry functions operate with all available keyless entry transmitters.
   - If the keyless entry system does not function properly with all available transmitters, refer to **Keyless Entry System Inoperative**.
3. With a scan tool, verify that no RVS Disable History is present.
   - If RVS disable history is present, refer to the applicable subsection in which the failure occurred.
4. With a scan tool, verify that there are no Current CTD Triggers present.
   - If a CTD trigger exists, refer to **Content Theft Deterrent (CTD) Alarm Mode Inoperative** .

REPAIR INSTRUCTIONS

REMOTE CONTROL DOOR LOCK RECEIVER REPLACEMENT

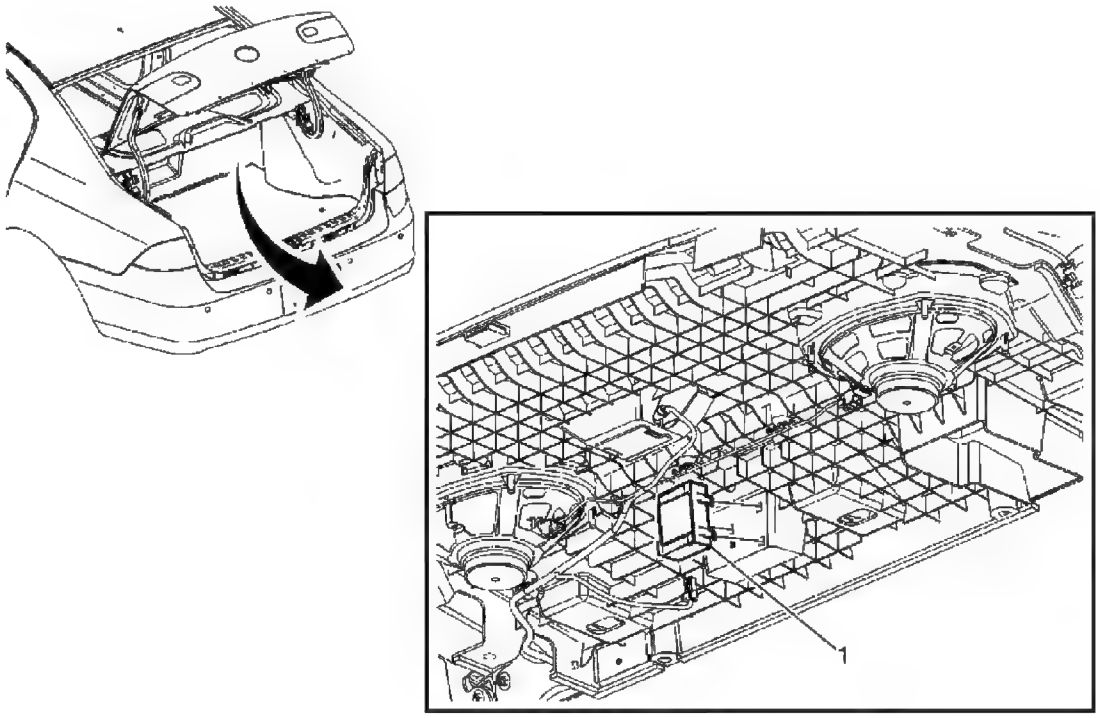


Fig. 7: Identifying Remote Control Door Lock Receiver
Courtesy of GENERAL MOTORS CORP.

Remote Control Door Lock Receiver Replacement

Callout	Component Name
Preliminary Procedures: Remove the right rear compartment side trim panel. Refer to **Rear Compartment Trim Panel Replacement** .	
1	Remote Control Door Lock Module **Procedures** 1. The module is secured with three integral tabs, pull away from the bracket to remove. 2. Disconnect the electrical connector. 3. Reprogram the remote control door lock module after installation. Refer to **Control Module References** .

TRANSMITTER BATTERY REPLACEMENT

Removal Procedure

1. Replace the batteries when the range of the transmitter decreases to less than 7 m (23 ft).

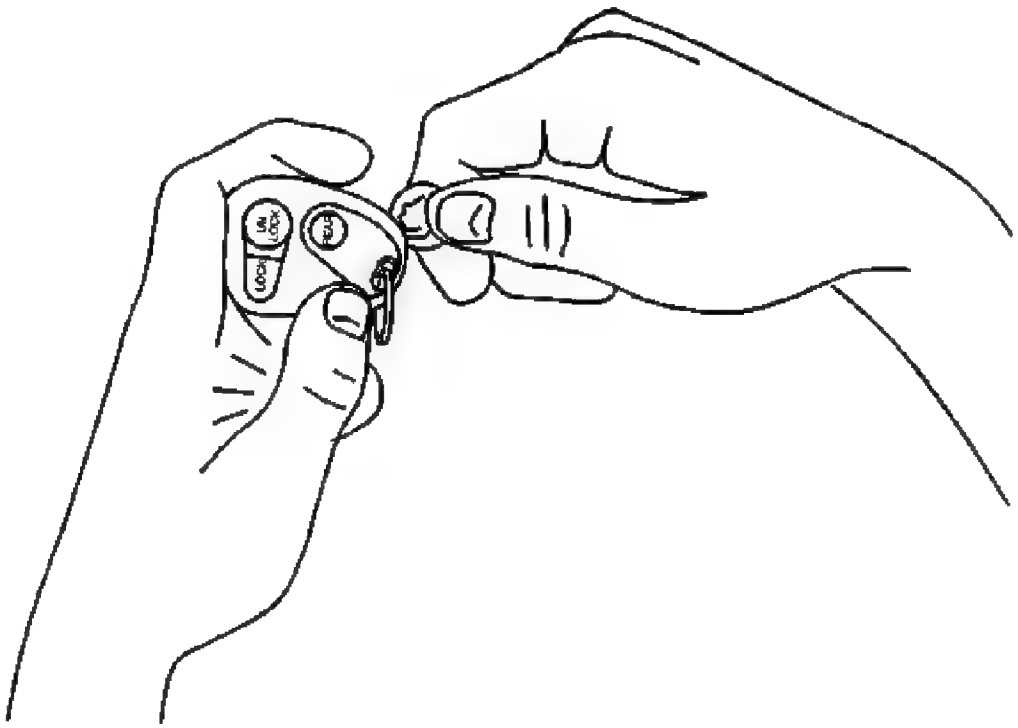


Fig. 8: Opening Transmitter Case
Courtesy of GENERAL MOTORS CORP.

2. Insert a small coin between the two halves of the transmitter case at the slot provided near the key ring hole.
3. Twist the coin in order to open the case.
4. Open the transmitter case.

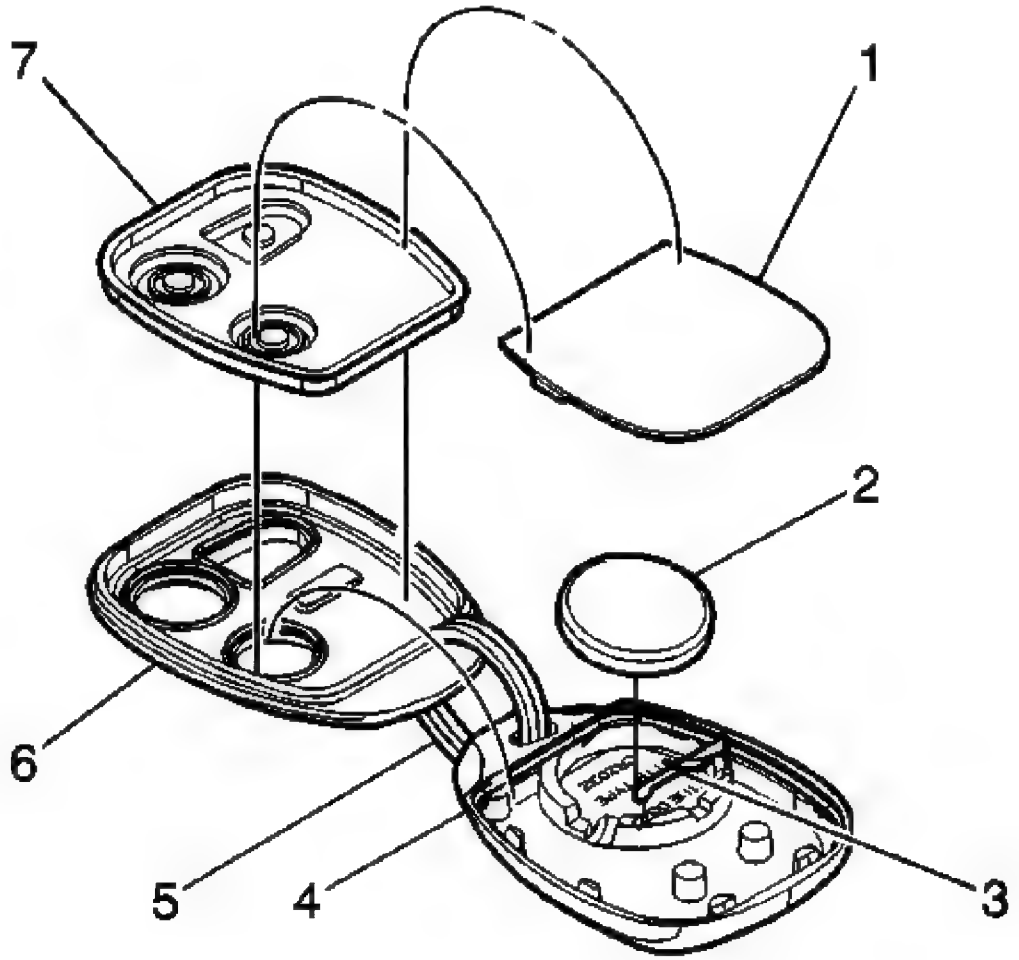


Fig. 9: View of Transmitter Battery & Case
Courtesy of GENERAL MOTORS CORP.

5. Remove the battery (2).

Installation Procedure

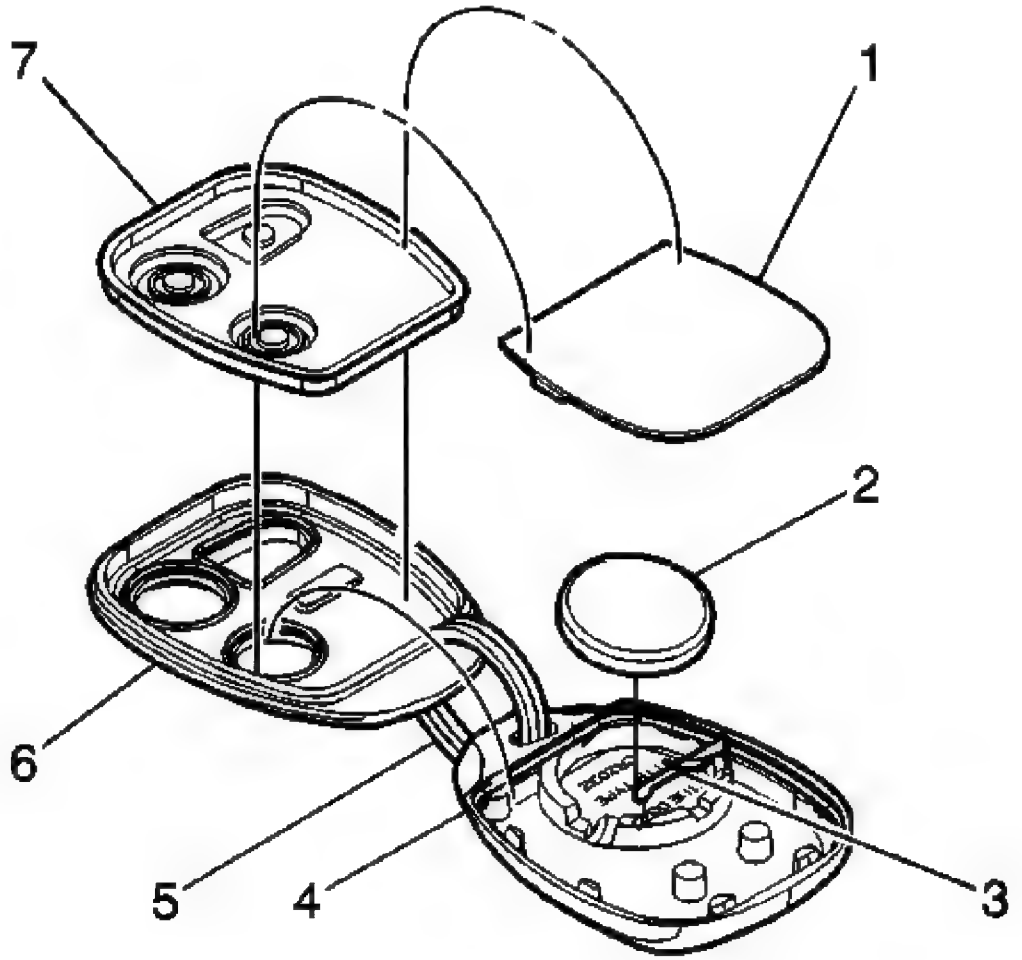


Fig. 10: View of Transmitter Battery & Case
Courtesy of GENERAL MOTORS CORP.

1. Install the battery (2) with the positive (+) side down.

   Use one 3 V CR2032 battery (or the equivalent).

2. Close the transmitter case (6, 4).

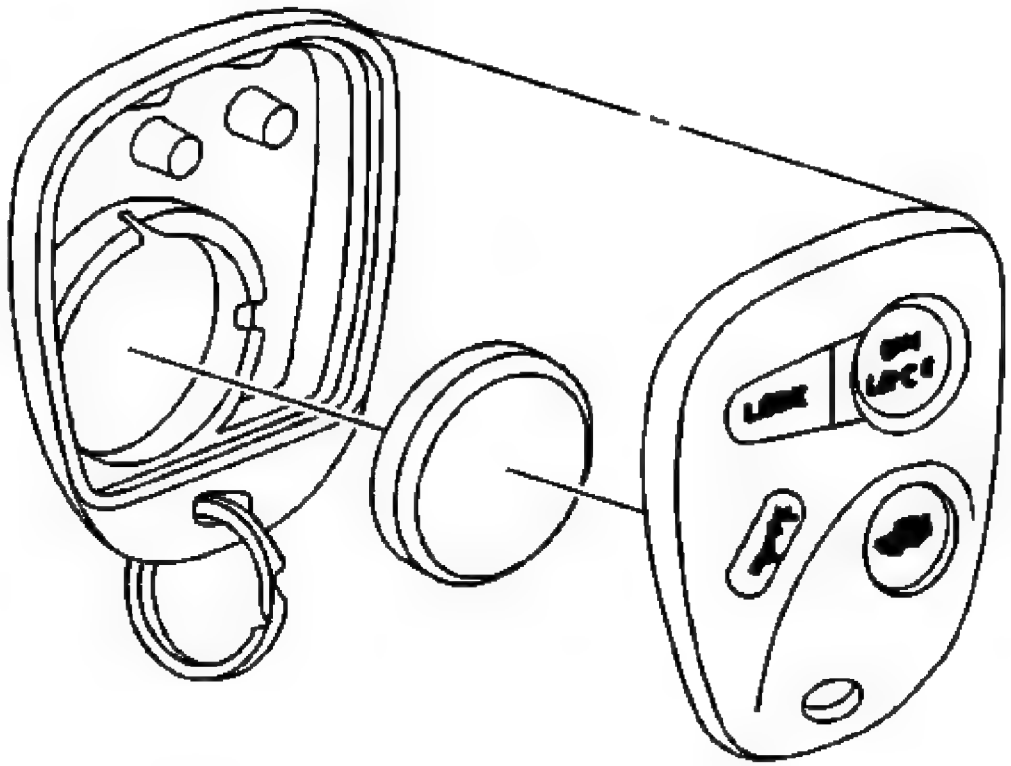


Fig. 11: Installing Battery
Courtesy of GENERAL MOTORS CORP.

3. Ensure that the seal is in position. Align the two halves of the case and snap the two halves together.
4. Reprogram the transmitter. Refer to **Transmitter Programming**.

TRANSMITTER PROGRAMMING

IMPORTANT: Keyless entry transmitters may also be programmed using the driver information center (DIC). Refer to the vehicle owners manual for information.

IMPORTANT: All transmitters which are to be recognized by the remote control door lock receiver (RCDLR) must be programmed in a single programming sequence. Once the Invalidate All Fobs selection is made, all learned transmitters are erased. Up to 8 transmitters can be programmed. Do not operate or program

the transmitters in the vicinity of other vehicles that are in the keyless entry program mode. This prevents the programming of the transmitters to the incorrect vehicle.

1. With a scan tool, access the Remote Control Door Lock Receiver Module Setup menu. Select Program Key Fobs.
2. Select Invalidate All Fobs. This will erase all learned keyless entry transmitters and prepare the RCDLR to learn transmitters.
3. Select Next Available Slot. Follow the on-screen instructions. Simultaneously hold the LOCK and UNLOCK buttons on the keyless entry transmitter to program.
4. When all the desired transmitters have been programmed, exit the vehicle and operate the transmitter functions in order to verify correct system operation.

DESCRIPTION AND OPERATION

KEYLESS ENTRY SYSTEM DESCRIPTION AND OPERATION

Keyless Entry System Description and Operation

The keyless entry system is a vehicle entry device. The keyless entry system is used in conjunction with the door locks to unlock the vehicle. Keyless entry will lock/unlock a door or open the rear compartment lid when a corresponding button on the keyless entry transmitter is pressed. This is accomplished by the transmitter sending a radio frequency to the remote control door lock receiver (RCDLR). The RCDLR interprets the signal and activates the requested function via a serial data message to the body control module (BCM). A low transmitter or vehicle battery or radio frequency (RF) interference from aftermarket devices, such as 2-way radios, power inverters, computers, etc., may cause a system malfunction. High RF traffic areas may also cause interference that could lead to a malfunction. Keyless entry allows you to operate the following components:

- The door locks
- The rear compartment lid release
- Remote vehicle starting
- The illuminated entry lamps

The keyless entry system has the following components:

- The keyless entry transmitters
- The keyless entry antenna (located in the vehicle glass)
- The BCM
- The RCDLR

Keyless Entry Transmitters

The keyless entry transmitter are used to lock and unlock the vehicle, as well as open the rear compartment, from a distance of up to 60 feet (18 m) away. Up to 8 transmitters may be programmed to a single vehicle.

Keyless Entry Antenna

The keyless entry antenna is used to receive radio frequency (RF) communications sent by the keyless entry transmitters.

The keyless entry antennas is an integral part of the vehicle windshield or rear glass, depending on application. A coax antenna lead connects the antenna to the remote control door lock receiver (RCDLR). When a transmitter button is present, the RF signal sent by the transmitter is received by the antenna and the communications are inputted to the RCDLR.

Remote Control Door Lock Receiver (RCDLR)

The remote control door lock receiver (RCDLR) is a multi-function module that operates both the keyless entry system as well as the TPM system. When an RF message is received from a keyless entry transmitter, the RCDLR interprets this signal and will request via serial data that the body control module (BCM) perform the specific function, i.e. door lock, door unlock or rear compartment lid release.

Unlock Driver Door Only

Momentarily press the transmitter UNLOCK button in order to perform the following functions:

- Unlock only the driver door.
- Illuminate the interior lamps for a determined length of time or until the ignition is turned ON.
- Flash the exterior lights, if enabled through the driver information center (DIC).
- Disarm the Content Theft Deterrent (CTD) System, if equipped.
- Deactivate the CTD system when in the alarm mode.

Unlock All Doors - Second Operation

Momentarily press the transmitter UNLOCK button a second time, within 5 seconds of the first press, to perform the following functions:

Unlock the remaining doors.

Lock All Doors - Active

Press the transmitter LOCK button to perform the following functions:

- Lock all vehicle doors. Immediately turn off the interior lamps.
- Flash the exterior lights, if enabled through the driver information center (DIC).
- Chirp the horn if the LOCK button is pressed again within 5 seconds, if enabled through the DIC.
- Arm the Content Theft Deterrent (CTD) System, if equipped.

Rear Compartment Lid Release - Active

If the vehicle transaxle is in PARK and the ignition is in the OFF position, a single press of the transmitter rear compartment release button will open the rear compartment lid.

Panic Alarm/Vehicle Locator

Momentarily press the panic alarm/vehicle locator to perform the following functions:

- Flash the turn signal lamps three times.
- Honk the horn three times.

Press and hold the panic alarm/vehicle locator button for longer than 2 seconds to perform the following functions:

- Flash the turn signal lamps for 30 seconds.
- Honk the horn for 30 seconds.

Remote Vehicle Start (RVS)

The remote vehicle starting feature allows engine starting from outside of the vehicle from a distance of up to 195 feet (60 m). It also activates the vehicles automatic climate control system, if equipped. If moderate or warmer outside temperatures exist, the climate control system will default to automatic temperature control and fan speed to regulate and maintain a moderate inside temperature. When the outside temperature is cold, the climate control system will start up the rear window defogger and default to the front windshield defrost mode with the heat on and the fan blower set to high. If the vehicle has heated seats, they will also turn on. Cooled seats, if equipped, are not activated during a remote start. Normal operation of the climate control system will return after the key is turned to RUN.

To operate the function, first press and release the lock button on the keyless entry transmitter, then immediately press and hold the RVS button for 4 seconds. The vehicle park lamps will be illuminated to indicate that the engine is running. The RVS function is allowed to start the vehicle 2 times for 10-minute intervals. If the vehicle is left running it will automatically shut off after 10 minutes unless a time extension has been done. If the RCDLR receives a second request for an RVS event while already operating in RVS, the first timer will expire and the

second timer will start. For example, if 7 minutes after the initial RVS request, the RVS event is extended, the total time for the RVS event would be 17 minutes. To extend an RVS event, first press and release the transmitter lock button, then press and hold the RVS button. When you enter the vehicle during a remote start and the engine is still running, insert the key into the ignition and turn the key to RUN to drive the vehicle; this will transition the vehicle to normal operation.

RVS can be deactivated by pressing the RVS button on the keyless entry transmitter, pressing the hazard switch or by turning On the ignition, then turning it OFF. There are also other safety and security measures that will deactivate RVS, these include depressing the accelerator pedal or opening the hood. RVS may not function when DTCs are set. In these instances, the park lights will flash once when the RVS signal is received by the RCDLR, but the vehicle will not start. If the vehicle is put into valet mode, if equipped, by pressing the valet switch, RVS will also be disabled.

While in RVS mode all modules that are normally powered when the ignition is ON are active. All on-board diagnostics (OBD) II functions are also active.

The RVS feature can be turned off through the DIC. Other RVS features may also be turned on or off via the driver information center (DIC).

Enable/Disable RVS

To disable the remote vehicle start (RVS) function, perform the following steps:

1. Turn ON the ignition, with the engine OFF.
2. Access the Remote Start personalization features within the driver information center (DIC).
3. Enable or disable the Remote Start feature.

The current state of RVS can be viewed through the DIC display under the Remote Start the display will read either ON or OFF.

When valet mode is enabled by pressing the valet switch (if equipped), RVS operation will be disabled.

Hood Ajar Switch

The hood switch provides status of the hood to the body control module for remote vehicle start (RVS) and content theft deterrent (CTD) functions. It is integrated into the hood latch assembly. The hood ajar switch provides 2 separate inputs to the body control module (BCM). These separate inputs allow the BCM to actively monitor for a hood ajar switch fault.

Circuit Description (RVS)

The remote control door lock receiver (RCDLR) receives a signal from the keyless entry transmitter indicating a remote vehicle start (RVS) request. A message is then sent to the body control module (BCM) which determines if a crank request message will be sent to the engine control module (ECM) to allow engine starting. To determine if conditions are correct for an RVS event, the BCM will ensure the following conditions are met:

- The key is not in the ignition.
- The vehicle is not in valet mode (if equipped).
- All vehicle doors are closed.
- The rear compartment lid is not ajar.
- A valid hood ajar switch closed signal is present.
- The doors are locked.
- The hazard switch is OFF.
- The vehicle power mode is correct.
- No content theft deterrent (CTD) alarm triggers are present.

When the BCM determines all conditions meet those required for an RVS event, a message is sent via serial data to the ECM. The ECM relies on the RVS message from BCM to enable RVS when the crank request signal is received. If the ECM does not receive a valid RVS message, it will not attempt to start the engine. While the ECM is in RVS mode it will suspend engine operation if any of the following additional conditions occur:

- Vehicle speed is greater than 0.
- Transmission is not in PARK.
- Excessive engine coolant temperature
- Low oil pressure
- The malfunction indicator lamp (MIL) is commanded ON.
- Engine crank time is greater than 30 seconds.
- Excessive engine speed.
- Accelerator pedal position too high.
- Remote start timer equals 0.
- Vehicle theft deterrent (VTD) indicates tamper.

Keyless Entry Personalization

Vehicle lock/unlock functions and remote vehicle start (RVS) settings may be personalized for 2 separate drivers. For mode descriptions and programming instructions, refer to **Vehicle Personalization** .

Rolling Code

The keyless entry system uses rolling code technology. Rolling code technology prevents anyone from recording the message sent from the transmitter and using the message in order to gain entry to the vehicle. The term "rolling code" refers to the way that the keyless entry system sends and receives the signals. The transmitter sends the signal in a different order each time. The transmitter and the remote control door lock receiver (RCDLR) are synchronized to the appropriate order. If a programmed transmitter sends a signal that is not in the order that the RCDLR expects, then the transmitter is out of synchronization. This occurs after 256 presses of any transmitter button when it is out of range of the vehicle.

Automatic Synchronization

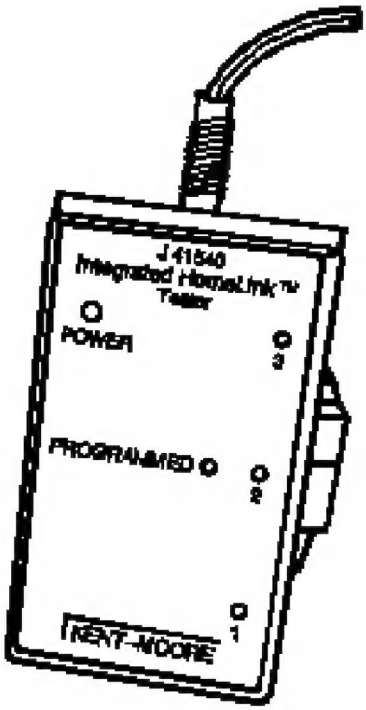
The keyless entry transmitters do not require a manual synchronization procedure. If needed, the transmitters automatically resynchronize when any button on the transmitter is pressed within range of the vehicle. The transmitter will operate normally after the automatic synchronization.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Special Tools

Illustration	Tool Number/Description
	J 41540 Homelink Tester

Illustration	Tool Number/Description
	J 43241 Keyless Entry Tester